

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

What is claimed is:

1. (Currently Amended) A medical device for the treatment of abnormal tissue growth in a patient's body comprising:
 - a power source;
 - circuitry coupled to said power source;
 - at least one electrode operably coupled to said circuitry wherein said circuitry delivers direct current electrical therapy to said at least one electrode continuously for a period of time not less than 1 minute for the treatment of abnormal tissue growths; ~~and~~
 - a catheter operatively ~~associated with the at least one electrode and~~ implanted into the patient's body and into contact with the abnormal tissue growth for delivering a therapeutic agent to the abnormal tissue growth, said catheter having a central lumen open at a proximal end and a distal end, the distal end positioned at or near the abnormal tissue growth and the proximal end positioned external to the body and away from the abnormal tissue growth; and
 - an electrode array comprising a plurality of electrodes coupled to the circuitry and configured to steer the therapeutic agent along a predetermined path from the catheter distal end.
2. (Original) The device of claim 1 wherein said direct current electrical therapy

involves the use of multiple voltages.

3. (Original) The device of claim 1 wherein said direct current electrical therapy is applied at a voltage for a time period of between 1 minute and 1 day.

4. (Original) The device of claim 1 wherein said direct current electrical therapy is applied at a voltage for a time period of between 1 hour and 1 week.

5. (Original) The device of claim 1 wherein said direct current electrical therapy is applied at a voltage for a time period of between 1 and 120 minutes.

6. (Original) The device of claim 1 wherein said device monitors and senses at least one voltage from within a tissue of the patient's body.

7. (Original) The device of claim 6 wherein said direct current electrical therapy is adjusted according to the sensed tissue voltage.

8. (Original) The device of claim 7 wherein said direct current electrical therapy is applied for a time period between 1 hour and 1 month.

9. (Previously Presented) The device of claim 1 wherein said direct current electrical therapy alternates between positive and negative voltages at periodic intervals of at least about one hour to avoid corrosion of the at least one electrode.

10. (Original) The device of claim 1 further comprising an electrical port contact coupled to said device in order to receive externally generated electrical therapies.

Claims 11 through 18 (canceled)

19. (Previously Presented) The device of claim 1 wherein said direct current electrical therapy is applied at a voltage between 1 volt and 20 volts.

20. (Canceled)

21. (Previously Presented) The device of claim 1 wherein said direct current electrical therapy is applied at voltages and time periods sufficient for changing the pH by at least 2.0 inside or around said abnormal tissue growth.

22. (Previously Presented) The device of claim 1 wherein said direct current electrical therapy is applied at a voltage between 20mV and 500mV.

23. (Canceled)

24. (Previously Presented) The device of claim 1 wherein said direct current electrical therapy is applied at voltages and time periods sufficient to attract white blood cells.

25. (Previously Presented) The device of claim 1 wherein said direct current electrical therapy is applied at a voltage between 100mV and 50 volts.

26. (Canceled)

27. (Currently Amended) The device of claim 1 wherein the plurality of electrodes are arranged in an arc around the distal end of the catheter ~~said direct current electrical therapy is applied as a series of voltage pulses between 20 and 900 volts.~~

28. (Previously Presented) The device of claim 1 wherein said direct current electrical therapy is applied as a series of voltage pulses wherein said voltage pulses have a pulse width of between 100 μ s and 20 ms.

29. (Previously Presented) The device of claim 1 wherein said direct current electrical therapy is applied as a series of voltage pulses wherein said voltage pulses have a spacing period of between 100 μ s and 1 second.

30. (Original) The device of claim 29 wherein said voltage pulses number between 1 and 10,000.

31. (Currently Amended) The device of claim 1 wherein said ~~direct current~~ electrical therapy is applied at voltages and pulse widths sufficient to force open tumor cell membranes.

32. (Canceled)

33. (Canceled)

34. (Currently Amended) The device of claim 33 wherein said power source is implanted within the patient's body ~~direct current electrical therapy is applied at voltages between 1V and 50V.~~

35. (Previously Presented) The device of claim 34 wherein said direct current electrical therapy is applied for a time period between 10 minutes to 1 hour.

36. (Canceled)

37. (Currently Amended) The device of claim 1 further comprising an electrical port contact coupled to said device and at least partially implanted in the patient's body in order to receive externally generated electrical pulses from a power source external to the patient's body therapies.

38. (Currently Amended) The device of claim 1 further comprising at least one device selected from any of the group consisting of a drug reservoir, a drug pump, a communication means to synchronize said direct current electrical therapy with a drug delivery system, and circuitry to alternate output polarities to reduce levels of electrode corrosion and degradation.

39. (Previously Presented) The device of claim 1, wherein the electrode is internally connected to the catheter.

40. (Previously Presented) The device of claim 1, wherein the electrode is externally connected to the catheter and the catheter is configured to deliver a therapeutic agent.

41. (Currently Amended) The device of claim 40, wherein the catheter has a plurality of openings ~~is configured to placed in~~ contact with a plurality of multiple portions of the abnormal tissue growth.

42. (Canceled)

43. (Currently Amended) The device of claim 2, wherein the medical device further comprises a porous drug absorbing material coupled to the distal end of the catheter, said porous material in contact with the surface portion of the abnormal tissue growth. ~~catheter is coupled to an electrode array and configured to deliver a therapeutic agent to the abnormal tissue growth, wherein the electrode array comprises at least three electrodes configured to steer the therapeutic agent along a predetermined path.~~

44. (New) The device of claim 1, further comprising at least two concentric electrodes arranged within the porous material.

45. (New) The device of claim 1, further comprising a plurality of point electrodes configured on the porous material.

46. (New) A medical device for the treatment of abnormal tissue growth in a patient's body comprising:

a power source;

circuitry coupled to said power source;

a catheter implanted into the patient's body and into contact with the abnormal tissue growth, said catheter having a circumferential wall and a central lumen open at a proximal

end and a distal end, the distal end positioned at or near the abnormal tissue growth and the proximal end positioned outside the patient's body and away from the abnormal tissue growth;

a porous membrane having first and second faces extending across the lumen near the proximal end of the lumen;

first and second electrodes arranged on the exterior of the catheter, the first electrode having a first porous extension passing through a first wall portion of the catheter into the lumen and into alignment with the first face of the porous membrane and the second electrode having a second porous extension passing through a second wall portion of the catheter into the lumen and into alignment with the second face of the porous membrane.

47. (New) The device of claim 46 further comprising circuitry to alternate output polarities of the first and second electrodes to reduce levels of electrode corrosion and degradation.

48. (New) The device of claim 46 wherein said direct current electrical therapy alternates between positive and negative voltages at periodic intervals of at least about one hour to avoid corrosion of the at least one electrode.

49. (New) The device of claim 46 further comprising an electrical port contact coupled to said device and implanted into the patient's body in order to receive externally generated electrical therapies.

50. (New) The device of claim 46 wherein said direct current electrical therapy is applied at a voltage between 1 volt and 20 volts.

51. (New) The device of claim 46 wherein said direct current electrical therapy is applied at voltages and time periods sufficient for changing the pH by at least 2.0 inside or around said abnormal tissue growth.

52. (New) The device of claim 46 wherein said direct current electrical therapy is applied at a voltage between 20mV and 500mV.

53. (New) The device of claim 46 wherein said direct current electrical therapy is applied at voltages and time periods sufficient to attract white blood cells.

54. (New) The device of claim 46 wherein said direct current electrical therapy is applied at a voltage between 100mV and 50 volts.

55. (New) A medical device for the treatment of abnormal tissue growth in a patient's body comprising:

a power source;

circuitry coupled to said power source;

a plurality of electrodes coupled to the power source;

a catheter implanted into the patient's body and into contact with the abnormal tissue growth, said catheter having a proximal end disposed outside the patient's body, a lumen, and a plurality of diverging catheter distal ends that are placed into contact with the abnormal tissue growths, each one of the plurality of diverging catheter distal ends having a lumen and being coupled to at least one of the plurality of electrodes.

56. (New) The device of claim 55 further comprising a supplemental device selected from the group consisting of a drug reservoir, a drug pump, a communication means to synchronize said direct current electrical therapy with a drug delivery system, and circuitry to

alternate output polarities to reduce levels of electrode corrosion and degradation.

57. (New) The device of claim 55 wherein said direct current electrical therapy alternates between positive and negative voltages at periodic intervals of at least about one hour to avoid corrosion of the at least one electrode.

58. (New) The device of claim 55 further comprising an electrical port contact coupled to said device and implanted in the patient's body in order to connect to and disconnect from an external power source to receive externally generated electrical therapies when the external power source is connected to the port.

59. (New) The device of claim 55 wherein said direct current electrical therapy is applied at a voltage between 1 volt and 20 volts.

60. (New) The device of claim 55 wherein said direct current electrical therapy is applied at voltages and time periods sufficient for changing the pH by at least 2.0 inside or around said abnormal tissue growth.

61. (New) The device of claim 55 wherein said direct current electrical therapy is applied at a voltage between 20mV and 500mV.

62. (New) The device of claim 55 wherein said direct current electrical therapy is applied at voltages and time periods sufficient to attract white blood cells.

63. (New) The device of claim 55 wherein said direct current electrical therapy is applied at a voltage between 100mV and 50 volts.